

(7) Ship's service and emergency electrical generation system and its necessary auxiliaries; and

(8) A marine engineering system identified by the cognizant OCMI as being crucial to the survival of the vessel or to the protection of the personnel on board.

(b) For the purpose of this part, a system not identified in paragraph (a) of this section is a non-vital system.

(c) Piping used in a vital system must meet §56.60 in subchapter F of this chapter, except that §119.730 of this part replaces §56.60–20 in subchapter F of this chapter.

**§ 119.715 Piping subject to more than 1,034 kPa (150 psig) in non-vital systems.**

Piping subject to more than 1034 kPa (150 psig) in a non-vital system must be designed, fabricated, and inspected in accordance with the principles of American National Standards Institute (ANSI) B 31.1 "American National Standard Code for Pressure Piping, Power Piping," or other standard specified by the Commandant.

**§ 119.720 Nonmetallic piping materials.**

Nonmetallic piping materials, including nonmetallic flexible hose assemblies, must meet the requirements of §56.60–25 in subchapter F of this chapter.

**§ 119.730 Nonferrous metallic piping materials.**

(a) Nonferrous metallic piping materials are acceptable for use in the following:

- (1) Non-vital systems;
- (2) Aluminum fuel piping on an aluminum hulled vessel, if at least Schedule 80;
- (3) Aluminum bilge, ballast, and firemain piping on an aluminum hulled vessel;
- (4) If acceptable to the cognizant OCMI, nonferrous metallic piping with a melting temperature above 927° C (1,700° F) may be used in vital systems that are deemed to be galvanically compatible; and
- (5) Other uses specifically accepted by the cognizant OCMI.

(b) Where nonferrous metallic material is permitted for use in piping systems

by this subpart, the restrictions in this paragraph apply:

(1) Provisions must be made to protect piping systems using aluminum alloys in high risk fire areas due to the low melting point of aluminum alloys;

(2) Provisions must be made to prevent or mitigate the effect of galvanic corrosion due to the relative solution potentials of copper, aluminum, and alloys of copper and aluminum, which are used in conjunction with each other, steel, or other metals and their alloys;

(3) A suitable thread compound must be used in making up threaded joints in aluminum pipe to prevent seizing. Pipe in the annealed temper must not be threaded;

(4) The use of aluminum alloys with a copper content exceeding 0.6 percent is prohibited; and

(5) The use of cast aluminum alloys in hydraulic fluid power systems must be in accordance with the requirements of §58.30–15(f) in subchapter F of this chapter.

**PART 120—ELECTRICAL INSTALLATION**

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AUTHORITY: 46 U.S.C. 2103, 3306; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; 49 CFR 1.46.

SOURCE: CGD 85-080, 61 FR 928, Jan. 10, 1996, unless otherwise noted.

### Subpart A—General Provisions

#### § 120.100 Intent.

This part contains requirements for the design, construction, installation, and operation of electrical equipment and systems including power sources, lighting, motors, miscellaneous equipment, and safety systems.

#### § 120.115 Applicability to existing vessels.

(a) Except as otherwise required by paragraphs (b) and (c) of this section, an existing vessel must comply with the regulations on electrical installations, equipment, and material that were applicable to the vessel on March 10, 1996, or, as an alternative, the vessel may comply with the regulations in this part.

(b) An existing vessel must comply with the requirements of §§ 120.420 and 120.430 of this part.

(c) New installations of electrical equipment and material, and the repair or replacement of wire and cable, on an existing vessel, which are completed to

the satisfaction of the cognizant Officer in Charge, Marine Inspection (OCMI) on or after March 11, 1996, must comply with this part. Replacement of existing equipment, not including wire or cable, installed on the vessel prior to March 11, 1996, need not comply with the regulations in this part.

### Subpart B—General Requirements

#### § 120.200 General design, installation, and maintenance requirements.

Electrical equipment on a vessel must be installed and maintained to:

- (a) Provide services necessary for safety under normal and emergency conditions;
- (b) Protect passengers, crew, other persons, and the vessel from electrical hazards, including fire, caused by or originating in electrical equipment, and electrical shock;
- (c) Minimize accidental personnel contact with energized parts; and
- (d) Prevent electrical ignition of flammable vapors.

#### § 120.210 Protection from wet and corrosive environments.

(a) Electrical equipment used in the following locations must be dripproof:

- (1) A machinery space;
- (2) A location normally exposed to splashing, water washdown, or other wet conditions within a galley, a laundry, or a public washroom or toilet room that has a bath or shower; or
- (3) Another space with a similar moisture level.

(b) Electrical equipment exposed to the weather must be watertight.

(c) Electrical equipment exposed to corrosive environments must be of suitable construction and corrosion-resistant.

#### § 120.220 General safety provisions.

(a) Electrical equipment and installations must be suitable for the roll, pitch, and vibration of the vessel underway.

(b) All equipment, including switches, fuses, lampholders, etc., must be suitable for the voltage and current utilized.

(c) Receptacle outlets of the type providing a grounded pole or a specific direct current polarity must be of a

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configuration that will not permit improper connection.

(d) All electrical equipment and circuits must be clearly marked and identified.

(e) Any cabinet, panel, box, or other enclosure containing more than one source of power must be fitted with a sign warning persons of this condition and identifying the circuits to be disconnected.

### Subpart C—Power Sources and Distribution Systems

#### § 120.310 Power sources.

(a)(1) Each vessel that relies on electricity to power the following loads must be arranged so that the loads can be energized from two sources of electricity:

(i) The vital systems listed in § 119.710 of this chapter;

(ii) Interior lighting except for decorative lights;

(iii) Communication systems including a public address system required under § 121.610 of this chapter; and

(iv) Navigation equipment and lights.

(2) Except as provided in § 120.312 of this part, a vessel with batteries of adequate capacity to supply the loads specified in paragraph (a)(1) of this section for three hours, and a generator or alternator driven by a propulsion engine, complies with the requirement in paragraph (a)(1) of this section.

(b) Where a ship service generator driven by a propulsion engine is used as a source of electrical power, a vessel speed change, throttle movement or change in direction of the propeller shaft rotation must not interrupt power to any of the loads specified in paragraph (a)(1) of this section.

#### § 120.312 Power sources on vessels of more than 19.8 meters (65 feet) in length with overnight accommodations for more than 49 passengers.

A vessel of more than 19.8 meters (65 feet) in length carrying more than 600 passengers or with overnight accommodations for more than 49 passengers must have:

(a) Two generator sets;

(b) An electrical power system that complies with the requirements of

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§§ 111.10–4, 111.10–5, 111.10–9, 111.10–11 in subchapter J of this chapter;

(c) A final emergency power source, as defined by § 112.01–20 in subchapter J of this chapter, with sufficient capacity to power the loads listed in § 112.15–5 in subchapter J of this chapter for three hours; and

(d) The final emergency power source located outside the machinery space.

[CGD 85–080, 61 FR 928, Jan. 10, 1996, as amended at 62 FR 51352, Sept. 30, 1997]

EFFECTIVE DATE NOTE: By CGD 85–080, 62 FR 51352, Sept. 30, 1997, § 120.312 was amended in the introductory text, after the word “length”, by adding the words “carrying more than 600 passengers or”, effective Oct. 30, 1997.

#### § 120.320 Generators and motors.

(a) Each generator and motor must be:

(1) In a location that is accessible, adequately ventilated, and as dry as practicable; and

(2) Mounted above the bilges to avoid damage by splash and to avoid contact with low lying vapors.

(b) Each generator and motor must be designed for an ambient temperature of 50° C (122° F) except that:

(1) If the ambient temperature in the space where a generator or motor will be located will not exceed 40° C (104° F) under normal operating conditions, the generator or motor may be designed for an ambient temperature of 40° C (104° F); and

(2) A generator or motor designed for 40° C (104° F) may be used in 50° C (122° F) ambient locations provided the generator or motor is derated to 80 percent of the full load rating, and the rating or setting of the overcurrent devices is reduced accordingly.

(c) A voltmeter and an ammeter, which can be used for measuring voltage and current of a generator that is in operation, must be provided for a generator rated at 50 volts or more. For each alternating current generator, a means for measuring frequency must also be provided.

(d) Each generator must have a nameplate attached to it containing the information required by Article 445 of the National Electrical Code (NEC) (National Fire Protection Association (NFPA) 70), and for a generator derated

in accordance with paragraph (b)(2) of this section, the derated capacity.

(e) Each motor must have a nameplate attached to it containing the information required by Article 430 of the NEC (NFPA 70), and for a motor derated in accordance with paragraph (b)(2) of this section, the derated capacity.

(f) Each generator must be protected by an overcurrent device set at a value not exceeding 115 percent of the generator full load rating.

[CGD 85-080, 61 FR 928, Jan. 10, 1996, as amended at 62 FR 51352, Sept. 30, 1997]

EFFECTIVE DATE NOTE: By CGD 85-080, 62 FR 51352, Sept. 30, 1997, § 120.320 was amended in paragraph (b)(2) by adding the letter "C" after "40°", effective Oct. 30, 1997.

#### § 120.322 Multiple generators.

When a vessel is equipped with two or more generators to supply ship's service power, the following requirements must be met:

(a) Each generator must have an independent prime mover; and

(b) The generator circuit breakers must be interlocked to prevent the generators from being simultaneously connected to the switchboard, except for the circuit breakers of a generator operated in parallel with another generator when the installation meets §§ 111.12-11(f), and 111.30-25(d) in subchapter J of this chapter.

#### § 120.324 Dual voltage generators.

(a) A dual voltage generator installed on a vessel shall be of the grounded type, where:

(1) The neutral of a dual voltage system must be solidly connected at the switchboard's neutral bus; and

(2) The neutral bus shall be connected to ground.

(b) The neutral of a dual voltage system must be accessible for checking the insulation resistance of the generator to ground before the generator is connected to the bus.

(c) Ground detection must be provided that:

(1) For an alternating current system, meets § 111.05-27 in subchapter J of this chapter; and

(2) For a direct current system, meets § 111.05-29 in subchapter J of this chapter.

#### § 120.330 Distribution panels and switchboards.

(a) Each distribution panel and switchboard must be in as dry a location as practicable, adequately ventilated, and protected from falling debris and dripping or splashing water.

(b) Each distribution panel or switchboard must be totally enclosed and of the dead front type.

(c) Each switchboard must have non-conductive handrails.

(d) Each switchboard must be fitted with a dripshield.

(e) Distribution panels and switchboards that are accessible from the rear must be constructed to prevent a person from accidentally contacting energized parts.

(f) Working space must be provided around all main distribution panels and switchboards of at least 610 millimeters (24 inches) in front of the switchboard, and at least 455 millimeters (18 inches) behind the switchboard. Rear access is prohibited when the working space behind the switchboard is less than 455 millimeters (18 inches).

(g) Nonconducting mats or grating must be provided on the deck in front of each switchboard and, if accessible from the rear, on the deck in the rear of the switchboard.

(h) All uninsulated current carrying parts must be mounted on noncombustible, nonabsorbent, high dielectric insulating material.

(i) Equipment mounted on a hinged door of an enclosure must be constructed or shielded so that a person will not accidentally contact energized parts of the door mounted equipment when the door is open and the circuit energized.

(j) In the design of control, interlock, or indicator circuit, the disconnect device and its connections, including each terminal block for terminating the vessel's wiring, must not have electrically unshielded or uninsulated surfaces.

(k) Switchboards and distribution panels must be sized in accordance with § 111.30-19 in subchapter J of this chapter.

[CGD 85-080, 61 FR 928, Jan. 10, 1996; 61 FR 20556, May 7, 1996]

**§ 120.340 Cable and wiring requirements.**

(a) If individual wires, rather than cables, are used in systems greater than 50 volts, the wire must be in conduit.

(b) All cable and wire must:

(1) Have stranded copper conductors with sufficient current carrying capacity for the circuit in which they are used;

(2) Be installed in a manner to avoid or reduce interference with radio reception and compass indication;

(3) Be protected from the weather;

(4) Be installed with metal supports spaced not more than 610 millimeters (24 inches) apart, and in such a manner as to avoid chafing and other damage. The use of plastic tie wraps must be limited to bundling or retention of multiple cable installations, and not used as a means of support;

(5) Not be installed with sharp bends;

(6) Be protected by metal coverings or other suitable means if in areas subject to mechanical abuse. Horizontal pipes used for protection shall have 6 millimeter (.25 inch) holes for drainage every 1,520 millimeters (5 feet);

(7) Be suitable for low temperature and high humidity if installed in refrigerated compartments;

(8) Not be located in a tank unless the cable provides power to equipment in the tank; and

(9) Have sheathing or wire insulation compatible with the fluid in a tank when installed as allowed by paragraph (b)(8) of this section.

(c) Conductors in power and lighting circuits must be No. 14 American Wire Gauge (AWG) or larger. Conductors in control and indicator circuits must be No. 22 AWG or larger.

(d) Cable and wire for power and lighting circuits must:

(1) Meet Section 310-13 of the NEC (NFPA 70) except that asbestos insulated cable and dry location cables can not be used;

(2) Be listed by Underwriters Laboratories (UL), as UL Boat or UL Marine cable; or

(3) Meet § 111.60-1 in subchapter J of this chapter for cable and § 111.60-11 in subchapter J of this chapter for wire.

(e) Cable or wire serving vital systems listed in § 119.710 of this sub-

chapter or emergency loads must be routed as far as practicable from high risk fire areas, such as galleys, laundries, and machinery spaces.

(f) Cable or wire serving duplicated equipment must be separated so that a casualty that affects one cable does not affect the other.

(g) Each connection to a conductor or terminal part of a conductor must be made within an enclosure and have either:

(1) A pressure type connector on each conductor;

(2) A solder lug on each conductor;

(3) A splice made with a pressure type connector to a flexible lead or conductor; or

(4) A splice that is soldered, brazed, or welded to a flexible lead or conductor.

(h) A connector or lug of the set screw type must not be used with a stranded conductor smaller than No. 14 AWG except if there is a nonrotating follower that travels with the set screw and makes pressure contact with the conductor.

(i) Each pressure type wire connector and lug must meet UL 486A, "Wire Connectors and Soldering Lugs for Use With Copper Conductors," or other standard specified by the Commandant. The use of twist-on type wire nuts is permitted under the following conditions:

(1) The connections must be made within an enclosure and the insulated cap of the connector must be secured to prevent loosening due to vibration.

(2) Twist-on type connectors may not be used for making joints in cables, facilitating a conductor splice, or extending the length of a circuit.

(j) Each terminal block must have 6-32 terminal screws or larger.

(k) Wire connectors utilized in conjunction with screw type terminal blocks must be of the captive type such as the ring or the flanged spade type.

(l) A cable must not be spliced in a hazardous location.

(m) A cable may be spliced in a location, other than a hazardous location, under the following conditions:

(1) A cable installed in a subassembly may be spliced to a cable installed in another subassembly;

(2) For a vessel receiving alterations, a cable may be spliced to extend a circuit;

(3) A cable having a large size or exceptional length may be spliced to facilitate its installation; and

(4) A cable may be spliced to replace a damaged section of the cable if, before replacing the damaged section, the insulation resistance of the remainder of the cable is measured, and it is determined that the condition of the insulation is unimpaired.

(n) All material in a cable splice must be chemically compatible with all other material in the splice and with the materials in the cable.

(o) Ampacities of wires must meet Section 310-15 of the NEC (NFPA 70), or other standard specified by the Com-

mandant. Ampacities of cables must meet table A6 of Institute of Electrical and Electronic Engineers (IEEE) Standard 45, "Recommended Practice for Electrical Installations on Shipboard," or other standard specified by the Commandant. Ampacities for Navy cable must meet NAVSEA Design Data Sheet (DDS) 304-2 "Electrical Cable, Ratings and Characteristics" as appropriate.

(p) Conductors must be sized so that the voltage drop at the load terminals does not exceed 10 percent. Table 120.340(p) indicates the size of conductor required for corresponding lengths and steady state (stable) values to obtain not more than this voltage drop at the load terminals of a two conductor circuit.

TABLE 120.340(p)—CONDUCTOR SIZES FOR AMPERES—LENGTHS

Total current on circuit, amperes	Length of conductor in meters (feet) from source of current to most distant fixture										
	3.1 (10)	4.5 (15)	6.1 (20)	7.6 (25)	9.2 (30)	10.7 (35)	12.2 (40)	13.7 (45)	15.2 (50)	16.8 (55)	18.3 (60)
12 volts, 2-wire—10 percent drop wire sizes (A.W.G.)											
5 .....	14	14	14	14	14	14	14	14	12	12	12
14 .....	14	14	14	12	12	12	10	10	10	10	8
15 .....	14	14	12	10	10	10	8	8	8	8	8
20 .....	12	12	10	10	8	8	8	8	6	6	6
25 .....	10	10	10	8	8	8	6	6	6	6	4

Other values can be computed by means of the following formula:

$$cm = \frac{K \times I \times L (\times 2 \text{ for two-wire circuit})}{E}$$

Where:

cm = Circular-mil area of conductor.

K = 3.28 ohms/mil-meter (metric)

K = 10.75 ohms/mil-foot (english)

(a constant representing the resistance of copper).

I = Load current, in amperes.

L = length of conductor from center of distribution, in meters (feet).

E = Voltage drop at load, in volts.

(q) If used, each armored cable metallic covering must:

(1) Be electrically continuous; and

(2) Be grounded at each end of the run to:

(i) The metallic hull; or

(ii) The common ground plate on nonmetallic vessels; and

(3) Have final sub-circuits grounded at the supply end only.

(r) A portable or temporary electric cord or cable must be constructed and used in compliance with the requirements of §111.60-13 in subchapter J of this chapter for a flexible electric cord or cable.

[CGD 85-080, 61 FR 928, Jan. 10, 1996; 61 FR 20556, May 7, 1996, as amended at 62 FR 51352, Sept. 30, 1997]

EFFECTIVE DATE NOTE: By CGD 85-080, 62 FR 51352, Sept. 30, 1997, §120.340 was amended by revising the last sentence of paragraph (i) and adding paragraphs (i)(1) and (i)(2), effective Oct. 30, 1997. For the convenience of the user, the superseded text is set forth as follows:

#### §120.340 Cable and wiring requirements.

\* \* \* \* \*

(i) \* \* \* The use of wire nuts is prohibited.

\* \* \* \* \*

**§ 120.350 Batteries—general.**

(a) Where provisions are made for charging batteries, there must be natural or induced ventilation sufficient to dissipate the gases generated.

(b) Each battery must be located as high above the bilge as practicable, secured to protect against shifting with the roll and pitch of the vessel, and free from exposure to water splash or spray.

(c) Batteries must be accessible for maintenance and removal.

(d) Connections must be made to battery terminals with permanent type connectors. Spring clips or other temporary type clamps are prohibited.

(e) Batteries must be mounted in trays lined with, or constructed of, a material that is resistant to damage by the electrolyte.

(f) Battery chargers must have an ammeter connected in the charging circuit.

(g) If the batteries are not adjacent to a distribution panel or switchboard that distributes power to the lighting, motor, and appliance circuits, the battery lead must have a fuse in series, located as close as practicable to the battery.

(h) Batteries used for engine starting are to be located as close as possible to the engine or engines served.

**§ 120.352 Battery categories.**

This section applies to batteries installed to meet the requirements of § 120.310 of this part for secondary sources of power to vital loads, or sources of power to final emergency loads.

(a) *Large.* A large battery installation is one connected to a battery charger having an output of more than 2 kilowatts (kw), computed from the highest possible charging current and the rated voltage of the battery installation.

(b) *Small.* A small battery installation is one connected to a battery charger having an output of 2 kw or less, computed as above.

**§ 120.354 Battery installations.**

(a) *Large batteries.* Each large battery installation must be located in a locker, room or enclosed box solely dedicated to the storage of batteries. Ventilation must be provided in accordance with § 111.15–10 in subchapter J of this chapter.

Electrical equipment located within the battery enclosure must be approved by an independent laboratory for Class I, Division 1, Group B hazardous locations and meet § 111.105 in subchapter J of this chapter.

(b) *Small batteries.* Each small battery installation must be located in a well ventilated space and protected from falling objects. A small battery installation must not be in a closet, storeroom, or similar space.

**§ 120.360 Semiconductor rectifier systems.**

(a) Each semiconductor rectifier system must have an adequate heat removal system that prevents overheating.

(b) Where a semiconductor rectifier system is used in a propulsion system or in other vital systems it must:

- (1) Have a current limiting circuit;
- (2) Have external overcurrent protection; and

(3) Meet Sections 35.84.2 and 35.84.4 of the American Bureau of Shipping (ABS), “Rules for Building and Classing Steel Vessels,” or other standard specified by the Commandant.

**§ 120.370 General grounding requirements.**

(a) A vessel's hull must not carry current as a conductor except for the following systems:

- (1) Impressed current cathodic protection systems; or
- (2) Battery systems for engine starting.

(b) Receptacle outlets and attachment plugs for portable lamps, tools, and similar apparatus operating at 100 volts or more, must have a grounding pole and a grounding conductor in the portable cord.

(c) Each nonmetallic mast and top mast must have a lightning ground conductor.

**§ 120.372 Equipment and conductor grounding.**

(a) All metallic enclosures and frames of electrical equipment must be permanently grounded to the hull on a

metallic vessel. On a nonmetallic vessel, the enclosures and frames of electrical equipment must be bonded together to a common ground by a normally non-current carrying conductor. Metallic cases of instruments and secondary windings of instrument transformers must be grounded.

(b) On a nonmetallic vessel, where a ground plate is provided for radio equipment, it must be connected to the common ground.

(c) Equipment grounding conductors must be sized in accordance with Section 250-95 of the NEC (NFPA 70), or other standard specified by the Commandant.

(d) Each insulated grounding conductor of a cable must be identified by one of the following means.

(1) A green braid or green insulation;

(2) Stripping the insulation from the entire exposed length of the grounding conductor; or

(3) Marking the exposed insulation of the grounding conductor with green tape or green adhesive labels.

(e) Cable armor must not be used to ground electrical equipment of systems.

#### **§ 120.376 Grounded distribution systems (Neutral grounded).**

(a) If a grounded distribution system is provided, there must be only one connection to ground, regardless of the number of power sources. This ground connection must be at the switchboard or at the common ground plate, which must be accessible.

(b) Each propulsion, power, lighting, or distribution system having a neutral bus or conductor must have the neutral grounded.

(c) The neutral or each grounded generation and distribution system must be grounded at the generator switchboard and have the ground connection accessible for checking insulation resistance of the generator to ground before the generator is connected to the bus, except the neutral of an emergency power generation system must be grounded with:

(1) No direct ground connection at the emergency switchboard;

(2) The neutral bus permanently connected to the neutral bus on the main switchboard; and

(3) No switch, circuit breaker, or fuse in the neutral conductor of the bus-tie feeder connecting the emergency switchboard to the main switchboard.

(d) On a metallic vessel, a grounded alternating current system must be grounded to the hull. On a nonmetallic vessel, the neutral must be connected to the common ground, except that aluminum grounding conductors must not be used.

#### **§ 120.378 Ungrounded systems.**

Each ungrounded system must be provided with a suitably sensitive ground detection system, located at the respective switchboard, that provides continuous indication of circuit status to ground with a provision to momentarily remove the indicating device from the reference ground.

[CGD 85-080, 62 FR 51352, Sept. 30, 1997]

EFFECTIVE DATE NOTE: By CGD 85-080, 62 FR 51352, Sept. 30, 1997, § 120.378 was added, effective Oct. 30, 1997.

#### **§ 120.380 Overcurrent protection.**

(a) Overcurrent protection must be provided for each ungrounded conductor for the purpose of opening the electric circuit if the current reaches a value that causes an excessive or dangerous temperature in the conductor or conductor insulation.

(b) The grounded conductor of a circuit must not be disconnected by a switch or circuit breaker, unless the ungrounded conductors are simultaneously disconnected.

(c) A conductor of a control, interlock, or indicator circuit, such as a conductor for an instrument, pilot light, ground detector light, or potential transformer, must be protected by an overcurrent device.

(d) Conductors must be protected in accordance with their current carrying capacities. If the allowable current carrying capacity does not correspond to a standard device size, the next larger overcurrent device may be used provided it does not exceed 150 per cent of the conductor current carrying capacity.

(e) Steering gear control system circuits must be protected against short circuit.



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(f) Each steering gear feeder circuit must be protected by a circuit breaker that meets the requirements of paragraphs (a) and (b) of §111.93-11 in subchapter J of this chapter.

(g) Each lighting branch circuit must be protected against overcurrent either by fuses or circuit breakers rated at not more than 30 amperes.

(h) Overcurrent devices capable of carrying the starting current of the motor must be installed to protect motors, motor conductors, and control apparatus against:

(1) Overcurrent due to short circuits or ground faults; and

(2) Overload due to motor running overcurrent, in accordance with §111.70-1 in subchapter J of this chapter. A protective device integral with the motor, which is responsive to both motor current and temperature, may be used.

(i) An emergency switch must be provided in the normally ungrounded main supply conductor from a battery. The switch must be accessible and located as close to the battery as practicable.

(j) Disconnect means must be provided on the supply side of and adjacent to all fuses for the purpose of de-energizing the fuses for inspection and maintenance purposes.

(k) If the disconnect means is not within sight of the equipment that the circuit supplies, means must be provided for locking the disconnect device in the open position.

(l) Fuses must be of the cartridge type only and be listed by Underwriters Laboratories or another independent laboratory recognized by the Commandant.

(m) Each circuit breaker must meet UL 489, "Molded-Case Circuit Breakers and Circuit Breaker Enclosures," or other standard specified by the Commandant, and be of the manually reset type designed for:

(1) Inverse time delay;

(2) Instantaneous short circuit protection; and

(3) Switching duty if the breaker is used as a switch.

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(n) Each circuit breaker must indicate whether it is in the open or closed position.

[CGD 85-080, 61 FR 928, Jan. 10, 1996; 61 FR 20556, May 7, 1996, as amended at 62 FR 51352, Sept. 30, 1997]

EFFECTIVE DATE NOTE: By CGD 85-080, 62 FR 51352, Sept. 30, 1997, §120.380 was amended in paragraph (f) by adding the word "of" before "§111.93-11", effective Oct. 30, 1997.

### § 120.390 Shore power.

A vessel with an electrical system operating at more than 50 volts, which is provided with a means to connect to shore power, must meet the following:

(a) A shore power connection box or receptacle must be permanently installed at a convenient location:

(b) A cable connecting the shore power connection box or receptacle to the switchboard or main distribution panel must be permanently installed;

(c) A circuit breaker must be provided at the switchboard or main distribution panel for the shore power connection; and

(d) The circuit breaker, required by paragraph (c) of this section, must be interlocked with the vessel's power sources so that shore power and the vessel's power sources may not be operated simultaneously.

### § 120.392 Radiotelephone installations.

A separate circuit, with overcurrent protection at the main distribution panel, must be provided for each radiotelephone installation.

## Subpart D—Lighting Systems

### § 120.410 Lighting fixtures.

(a) Each lighting fixture globe, lens, or diffuser must have a guard or be made of high strength material, except in an accommodation space, radio room, galley, or similar space where it is not subject to damage.

(b) A lighting fixture may not be used as a connection box for a circuit other than the branch circuit supplying the fixture.

(c) A lighting fixture must be installed as follows:

(1) Each fixture must comply with § 120.200.

(2) Each lighting fixture and lampholder must be fixed. A fixture must not be supported by the screw shell of a lampholder.

(3) Each pendant type lighting fixture must be suspended by and supplied through a threaded, rigid conduit stem.

(4) Each table lamp, desk lamp, floor lamp, or similar equipment must be secured in place so that it cannot be displaced by the roll or pitch of the vessel.

(d) An exterior lighting fixture in an electrical system operating at more than 50 volts must comply with the requirements of UL 595, "Marine Type Electric Lighting Fixtures," or other standard specified by the Commandant. A lighting fixture in an accommodation space, radio room, galley or similar interior space may comply with, UL 1570, "Fluorescent Lighting Fixtures," UL 1571, "Incandescent Lighting Fixtures," UL 1572, "High Intensity Discharge Lighting Fixtures," UL 1573, "Stage and Studio Lighting Units," or UL 1574, "Track Lighting Systems," as long as the general marine requirements of UL 595 are satisfied.

#### § 120.420 Navigation lights.

All vessels must have navigation lights that are in compliance with the applicable sections of the International and Inland Navigation Rules, except that a vessel of more than 19.8 meters (65 feet) in length must also have navigation lights that meet UL 1104, "Marine Navigation Lights," or other standard specified by the Commandant.

#### § 120.430 Portable lights.

Each vessel must be equipped with at least two operable portable battery lights. One of these lights must be located at the operating station and the other at the access to the propulsion machinery space.

#### § 120.432 Emergency lighting.

(a) Each vessel must have adequate emergency lighting fitted along the line of escape to the main deck from all passenger and crew accommodation spaces located below the main deck.

(b) The emergency lighting required by paragraph (a) of this section must automatically actuate upon failure of

the main lighting system. If a vessel is not equipped with a single source of power for emergency lighting, it must have individual battery powered lights which:

(1) Are automatically actuated upon loss of normal power;

(2) Are not readily portable;

(3) Are connected to an automatic battery charger; and

(4) Have sufficient capacity for a minimum of 2 hours of continuous operation.

(c) A vessel of more than 19.8 meters (65 feet) in length carrying more than 600 passengers or with overnight accommodations for more than 49 passengers must have an emergency lighting system that complies with Part 112 in subchapter J of this chapter.

[CGD 85-080, 61 FR 928, Jan. 10, 1996, as amended at 62 FR 51352, Sept. 30, 1997]

EFFECTIVE DATE NOTE: By CGD 85-080, 62 FR 51352, Sept. 30, 1997, § 120.432 was amended in paragraph (b)(4) by removing the number "6" and adding, in its place, the number "2" and, in paragraph (c), after the word "length", by adding the words "carrying more than 600 passengers or", effective Oct. 30, 1997.

#### § 120.434 Lifeboat and liferaft floodlights on vessels of more than 19.8 meters (65 feet) in length with overnight accommodations for more than 49 passengers.

Each vessel of more than 19.8 meters (65 feet) in length carrying more than 600 passengers or with overnight accommodations for more than 49 passengers must have floodlights for illuminating the stowage position and embarkation station of lifeboats, liferafts, rescue boats, and rescue platforms, where installed. These floodlights must meet the requirements of § 111.75-16 in subchapter J of this chapter.

[CGD 85-080, 61 FR 928, Jan. 10, 1996, as amended at 62 FR 51352, Sept. 30, 1997]

EFFECTIVE DATE NOTE: By CGD 85-080, 62 FR 51352, Sept. 30, 1997, § 120.434 was amended after the word "length", by adding the words "carrying more than 600 passengers or", effective Oct. 30, 1997.

## Subpart E—Miscellaneous Systems and Requirements

### § 120.520 Lifeboat winches.

Each electric power operated lifeboat winch must meet §111.95 in subchapter J and §160.015 in subchapter Q of this chapter, or other standard specified by the Commandant.

### § 120.530 Hazardous areas.

(a) Electrical equipment in lockers used to store paint, oil, turpentine, or other flammable liquids must be explosion-proof or be part of an intrinsically safe system.

(b) Explosion-proof equipment and intrinsically safe systems must meet the requirements of §111.105 in subchapter J of this chapter.

### § 120.540 Elevators.

Each elevator on a vessel must meet the requirements of American National Standards Institute (ANSI) A17.1. "Safety Code for Elevators, and Escalators," or other standard specified by the Commandant.

### § 120.550 General alarm systems.

(a) All vessels with overnight accommodations must be equipped with a general alarm system.

(b) A vessel of more than 19.8 meters (65 feet) in length with overnight accommodations for more than 49 passengers must have a general alarm that meets the requirements of §113.25 in subchapter J of this chapter.

(c) The public address system required by §121.610 of this chapter may be used to sound the general alarm signal.

## PART 121—VESSEL CONTROL AND MISCELLANEOUS SYSTEMS AND EQUIPMENT

### Subpart A—General Provisions

Sec.

- 121.100 General requirement.
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### Subpart B—Cooking and Heating

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- 121.402 Compasses.
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- 121.502 Requirements of the Federal Communications Commission.
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- 121.602 Internal communications systems.
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### Subpart G—Miscellaneous

- 121.702 Pollution prevention equipment and procedures.
- 121.704 Marine sanitation devices.
- 121.710 First aid kits.

AUTHORITY: 46 U.S.C. 2103, 3306; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; 49 CFR 1.46.

SOURCE: CGD 85-080, 61 FR 933, Jan. 10, 1996, unless otherwise noted.

## Subpart A—General Provisions

### § 121.100 General requirement.

(a) Vessel control systems and other miscellaneous systems and equipment required by this part must be suitable for the purposes intended.

(b) The cognizant Officer in Charge, Marine Inspection (OCMI) may require navigation, control, or communications equipment, in excess of the equipment specifically required by this part, on a vessel that is of a novel design, operates at high speeds in restricted or high traffic areas, operates in a dynamically supported mode, or operates on extended routes or in remote locations.

### § 121.115 Applicability to existing vessels.

(a) An existing vessel need not comply with §§121.402(c), 121.404, 121.410,